



Missouri Technology Corporation

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## MTC Strategic Plan

### New Technology Directions for Missouri

Missouri Technology Corporation

FY 2005 Strategic Plan

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## Executive Summary

The Missouri Technology Corporation exists to create wealth for the citizens of our state and improve their quality of life. It is clear that the creation of wealth for individuals and enterprises increasingly depends on technology. Generating a continuing stream of new discoveries and commercializing them is not only helpful to the success of our state's businesses, it is essential if they are to prosper in a highly competitive world. Likewise, improvements in people's quality of life depend on breakthroughs in medicine, food, shelter, energy and much more. And these breakthroughs should be commercialized. A lifesaving discovery does no good sitting on a scientist's laboratory bench; it can only help people if it is being made and distributed broadly. The Missouri Technology Corporation is committed to helping our state thrive through the discovery and use of technology.

The Missouri General Assembly established the Missouri Technology Corporation (MTC) by law in 1994 to be a statewide advocate for increasing economic growth and jobs by improving technology connections between universities and businesses; increasing public and private research and development investment; and improving methods for transferring and commercializing new discoveries. Through its existence, the MTC has served primarily in the role of researching technology-related issues, reporting on opportunities for technology-based economic development and advising past and present Governors, General Assemblies, and key officials in the Department of Economic Development.

The MTC also played important leadership roles in the establishment of a Research Alliance of Missouri (RAM), the Missouri Mathematics Academy, the University of Missouri Technology Park at Fort Leonard Wood and acted on behalf of the state in the retention and enhancement of Fort Leonard Wood during Base Realignment and Closure (BRAC) proceedings. It also fulfilled its legally mandated role of providing oversight for the state's Innovation Centers, which continue to be close partners in efforts to transfer and incubate technologies.

Only in 2004 did the MTC receive the funding necessary to hire a staff and embark on new efforts to fulfill its technology mission. Our new capacity will allow us to begin pursuing new ways to help increase research funding, to improve the identification and transfer of new discoveries, and to better connect those technologies with entrepreneurs and existing businesses.

Given our history of limited resources, the MTC has, by necessity and by choice, worked in partnership with others across the state in advocating the importance of technology and undertaking targeted initiatives that strengthen our technology base. In choosing to pursue some new directions, the MTC will not abandon the way it has worked in the past. The MTC's broad legislative mandate allows it to pursue far more initiatives than it can possibly undertake within the bounds of its current resources. By focusing its efforts on accomplishing those things that will make the most difference for Missouri and employing its additional capacity in partnership other public and private organizations, we believe we can show even more positive results. The following *New Technology Directions for Missouri* Strategic Plan for Fiscal Year 2005 sets the MTC's priority action areas for the year ahead.

## Introduction

Members of the Corporation's Board are dedicated to the proposition that if Missouri is to have a prosperous economic future, there must be a strong partnership of elected leaders, including the Governor and General Assembly; governmental agencies; businesses, labor and non-profit organizations; academic institutions; and economic development organizations-all working to achieve common economic goals. We believe that the future well-being of Missourians will be determined in large part by the vision, foresight, and accomplishments of this partnership.

In particular, we believe we must be aggressive in enabling Missouri's public and private sectors to have a greater capacity to adapt to and prosper because of global economic changes, which are inevitable.

We believe there should be a high level of concern about some of the impacts of globalization. In coming years, jobs, companies, and production capacity may continue the current trend of migrating outside of Missouri and the United States as business leaders choose to shift their operations to locations where businesses can produce the lowest cost products and services.

The antidote to counter this trend has become increasingly clear. In the long term, the factor that best creates sustainable job growth is innovation. Federal Reserve Board Chairman Alan Greenspan reminded us recently that, "Over the past half-century, the increase in the value of raw materials has accounted for only a fraction of the overall growth of the U.S. gross domestic product (GDP). The rest of that growth reflects the embodiment of ideas in products and services that consumers value. This shift of emphasis from physical materials to ideas as the core of value creation appears to have accelerated in recent decades." And in a recent edition of *Business Week*, an editorial restated a theme that is repeated too little in the popular media about what we need to do to create and retain jobs: "America's challenge is to keep its innovation economy running."

We agree. Given the speed of the movement toward globalization and the seemingly fragile state of the national economy, we believe our state needs to re-think some its public policies related to growth and development.

Missouri's economy, like that of our nation, is in a transition. As jobs in some traditional businesses, like heavy manufacturing, decline, new opportunities for job creation should be identified and aggressively pursued.

We believe the proper approach to bolster and strengthen Missouri's economy is to concentrate on strategies, like those contained in this Strategic Plan, that will help ensure the development of new companies, products and jobs based on higher levels of technological advancement and a more capable, productive workforce.

As the economy continues to change, we believe it is critical for our state to have a steadfast commitment to investing in those factors that have been proven to produce good jobs and growing companies-greater development and deployment of new technologies, a better environment for entrepreneurship, more education and skills training connected with business needs, and greater availability of capital that will allow new companies to form and succeed.

As Missouri faces the challenges of this globalization and the new economy, it must decide on the best uses of its finite resources to create wealth for Missouri businesses and citizens. The success of Silicon Valley, the Research Triangle Park and other internationally recognized technology corridors provides ample evidence of the wisdom of supporting technology development. Evidence suggests a full-scope plan must address the types of technology to be targeted, the funding necessary to develop critical mass in these technologies, and required skills of a technology-based workforce.

Missouri's technology strategy must capitalize on existing strengths and areas of strong potential. After extensive study of our industries, their interdependence, and their concentration relative to the nation, state economists have determined that Missouri possesses the critical mass necessary to become a national or regional leader in industries built around three key technology clusters: *life sciences, information technology, and advanced manufacturing*

While the concept of industry clusters is not new, it has become increasingly apparent that industries involved in certain key technologies are contributing disproportionately to the economic growth of our nation and our state.

These three industrial clusters directly or indirectly make up about 25 percent of Missouri's gross state product, and employ over 500,000 Missourians.

Of the state's three priorities, the sector that has received the most attention during the past three years is the life sciences. In 2001, a partnership that included the State of Missouri, the University of Missouri System, the Danforth Foundation and the Ewing Marion Kauffman Foundation commissioned a report from the Battelle Memorial Institute entitled, "Life Sciences and Missouri's Economic Future: An Opportunity to Build "One Missouri". That report, and others like it at the local and regional levels, concluded that Missouri has considerable assets, such as its public and private higher educational institutions and some unique research organizations like the Stowers Institute and the Danforth Plant Sciences Center, that give our state the potential for being a strong competitor in the life sciences.

The report concluded there is a potential to create as many as 21,000 permanent, well-paying jobs in Missouri life science industries over the next 10 years. But the report also notes that in order to achieve such growth, a strong partnership of public and private institutions must make major financial and policy commitments to developing the industry over the long term. The report concluded, "...while Missouri has the opportunity to become a leading center of the life sciences in the Midwest, this will happen only if the State of Missouri, its regions, universities, research institutions, and life sciences companies commit to investing in and leveraging the state's life science base over the long term. In addition, while Missouri may have a comparative advantage over its competitors due to the strength of its life science research base, the state will need to continue to build its R & D base and accelerate the movement of research findings into the marketplace to compete successfully with leading life science regions and other states vying to become life science centers."

Many of the Battelle recommendations have not yet been implemented because of state budget constraints, but several regional organizations have adopted life sciences strategies that are being pursued aggressively. The tremendous commitments to promoting the life sciences in the Kansas City, St. Louis, and Columbia regions are examples of the kind of efforts that we believe needs to occur across the state over the next several years if Missouri if to be successful in this vital industry. We believe that a sustained, state-level commitment to the life sciences recommended by Battelle should be made by policy makers as soon as possible. Failing to act soon will mean that other states and regions will capture much of the opportunity for creating new jobs and companies that should occur here.

We also believe that a similar policy commitment should be made to developing Missouri's other key industry sectors, advanced manufacturing and information technology. Since there are cross linkages between these sectors, such as bioinformatics and pharmaceutical manufacturing, a coordinated "cluster" strategy for developing Missouri's three key industry sectors would be a sound economic development plan.

The stakes are enormous. While technology-based economic development is not a panacea, we believe it is important that it become an even more important part of the state's commitment to future economic health.

The Missouri Technology Corporation looks forward to being a key part of the state's efforts to meet the challenges of the future.

### About the MTC

Created by an act of the General Assembly in 1994, the Missouri Technology Corporation (MTC) is incorporated as a private, not-for-profit organization led by a 15 member Board of Directors, 11 of whom are appointed by the governor. The Board is comprised of leaders in the fields of science and technology and representatives of public and private universities, businesses, and the public. The MTC is charged by law with being a focal point for creating better ways Missouri businesses can interface with universities in order to solve technical and productivity issues; for bringing more research funding and emphasis to Missouri universities, especially involving the life sciences, information technology and advanced manufacturing; and for creating and managing a system to transfer new discoveries into the marketplace in order to create companies and jobs.

The MTC is assigned by state law the role of being the state's technology advocate. The law directs the MTC to "contribute to the strengthening of the economy of the State of Missouri through the development of science and technology, to promote the modernization of Missouri businesses by supporting the transfer of science, technology and quality improvement methods to the workplace, and to enhance the productivity and modernization of Missouri businesses by providing leadership and the establishment of methods of technology application, technology commercialization and technology development."

In advocating for a greater state focus on technology, it is to supply a long-term, results-oriented vision and plans that can be used by policy-makers to guide state efforts to modernize the economy and give businesses the advantages they need to compete in the global marketplace.

The MTC is committed to fostering enduring private/public partnerships that will bring about changes in public policy that will meet Missouri's current and future needs. The MTC works with and through partners across Missouri. It is committed to building networks and collaborations that connect our state's individual resources so we become a stronger magnet to attract from across the country the ideas, people and funds that can help us remain competitive and flourish.

While we are required to report directly to the governor, over the years our closest policy and operational partner has been the Missouri Department of Economic Development (DED). We wish to acknowledge the indispensable support and guidance given to the Board and its executive director by the Department's Director, the Deputy Director, the General Counsel, and other key officials. Without the active assistance of the Department, the MTC's expanded role in supporting the state's efforts to increase technology-based economic growth would not be possible.

Even though the MTC Board has met regularly since January 1995, it has not previously adopted a set of strategic goals apart from those of DED. While it is critical that DED continue to be the MTC's closest and most important partner, the Corporation's Board believes it also has the opportunity and an obligation to expand its work in encouraging the growth of innovation in Missouri by fostering additional partnerships. The MTC is determined to operate in a manner that will compliment and enhance the Department's ability, and that of our other economic development partners, to ensure long-term growth and prosperity in Missouri communities in all areas of the state.

### New Strategic Directions

In 2004, the MTC gained new capacity to fulfill its unique role of being an advocate for more investments in cutting edge research, the development of new products and processes based on new ideas, and increasing the commercial benefits that come from our new discoveries. The MTC also concluded that it should develop its first ever strategic plan that would guide it and its partners in achieving new, measurable progress in implementing desired policy changes. This *Strategic Plan* lays out for Missouri's citizens and leaders some of the challenges we face as a state, and what we intend to do about those challenges.

### Vision

Missouri will be recognized as the home of world-class research institutions and companies whose technologies and products bring about abundant jobs, a vibrant economy and healthy citizens.

### Mission

The mission of the Missouri Technology Corporation is to promote, advocate and provide leadership is support of technology access for Missouri companies and citizens so they can enhance research, development, and technology commercialization, which will create economic growth, sustainable jobs and wealth.

## Strategic Challenges

- Build a stronger reputation with elected officials and policy makers
- Build on strategic partnerships
- Achieve a greater geographic balance in technology efforts
- Develop sustained funding sources for technology programs
- Improve technology transfer to industry
- Raise awareness of the impact and import of technology-drive economic development
- Better connect people to the state's existing technology resources
- Significantly increase research and development spending in Missouri

## Goals

With the assistance of its key partners, the Missouri Technology Corporation Board has adopted goals it wants to achieve in Fiscal Year 2005 and beyond. The MTC has also adopted a set of strategies to guide its actions. During the coming year, the MTC intends to build additional partnerships, leverage new sources of funding and accomplish measurable results that were not possible in the past. The Fiscal Year 2005 goals and strategies are the following:

### **1) Increase the level of knowledge among policy makers and citizens on the role of technology and innovation in promoting economic growth**

#### **Desired outcome:**

Passage of legislative and budgetary priorities during the 2005 and subsequent legislative sessions that will increase technology development and deployment in Missouri

#### **Strategies:**

- meet with and inform key members of the General Assembly and legislative staff about the MTC's goals, methods and achievements
- sponsor a new series of roundtable discussions on the future of Missouri's key industry clusters
- construct and continually update a "Show-Me Innovation Index"
- designate a state science and technology advisor to work with the Governor and General Assembly
- publish a new "Missouri Technology Plan" that can serve as a guide for policymakers in the formation of new technology policies

### **2) Develop sources of meaningful, sustained funding for technology initiatives that supplement state funding**

#### **Desired outcome:**

- Increase Missouri universities' success in attracting federal and private funding for research and development
- Increase in the ability of the MTC to fund technology initiatives within our state.
- Decrease in the percentage MTC's total budget provided by the General Assembly

#### **Strategies:**

- build new, value-added economic development partnerships around key industry clusters
- seek grant funding from the federal government, foundations and private businesses that will allow the MTC to play a greater role in technology development, transfer and commercialization
- in partnership with the Research Alliance of Missouri, enable and broker collaborative research projects that connect research institutions and businesses
- investigate the acquisition of sustaining funds from MTC member organizations

### **3) Develop and maintain easily accessible inventories of research assets, initiatives, projects, networks and funding sources throughout the state**

**Desired outcome:**

- Increase the number of economic development projects commenced and completed that can be attributed to the use of technology-related services and information
- Increase the number of new, technology-based companies formed in Missouri

**Strategies:**

- partner with the University of Missouri and the State SBIR/STTR Assistance Centers to complete and deploy the I<sup>3</sup> (Innovation Information Infrastructure) system
- create a web-accessible research database that includes researchers, research projects, and intellectual property in fields of discovery related to Missouri's targeted industries

**4) Increase the amount of company creation and growth based on the transfer of technologies and the availability of investment capital.**

**Desired outcome:**

- Increase the number of technology transfer agreements
- Increase the volume of venture capital investment
- Demonstrate positive change in Missouri's "Show-Me Innovation Index"

**Strategies:**

- concentrate support efforts on Fort Leonard Wood as a strategic asset for technology transfer, company creation and technology based job growth
- devise a Missouri Technology Commercialization Plan that includes model Intellectual Property and Technology Licensing policies that can be utilized by Missouri's universities and entrepreneurs
- provide advocacy, support and funding for a "Phase Zero" grant program that assists entrepreneurs who are trying to get SBIR or STTR proposals submitted to the federal government
- develop a more robust set of criteria for evaluating new innovation center proposals and for measuring the success of existing innovation centers
- ensure adequate and coordinated funding the Innovation Center network

### **Focusing on Results**

Since it began service to the state in January 1995, the Missouri Technology Corporation has been active in key efforts to increase the amount of technology-based entrepreneurship, help Missouri businesses be more competitive in the global marketplace, and strengthen the economy by helping to create and retain technology-based jobs.

During most of its existence, the MTC was an organization that provided advocacy and advice to the state's policy-makers in the Department of Economic Development, the Office of the Governor, and to the Missouri General Assembly. Particularly since the MTC was an organization without independent means, many of its accomplishments were done in partnership with other organizations that contributed necessary resources. Nonetheless, the MTC is has been able to contribute to the economic well being of the state and its regions through the following initiatives:

**· Founding and establishment of the Research Alliance of Missouri (RAM)**

Efforts to create a Research Alliance were initiated by Missouri Governor Bob Holden in January 2003. In the words of the Governor, "The Research Alliance presents its members with a unique networking opportunity that will allow them to pool their resources, exchange research ideas and turn this research into commercial opportunities. Members of the alliance will be able to see what others are doing in research. In some cases, perhaps one university's project is similar to another's work. The alliance will allow its members the opportunity to determine which research projects are complementary, and how resources can be combined for the best result. The alliance will also allow businesses to communicate what their workforce needs are, and how university research may best serve them."

In response to Governor Holden's request, DED and the MTC arranged for representatives of Missouri's research universities to hold their initial and subsequent meetings. The delegates to the initial meetings chose a officers, adopted a mission statement, instituted a formal meeting schedule and chose projects on which to focus. Today the RAM is a very active organization and is aggressively pursuing a broad agenda of projects and collaboratives that promise to bring new benefits to the members institutions and to all of Missouri.



The MTC considers the RAM to be its strategic partner in an effort to focus on the practical benefits that be achieved by researchers from all of Missouri's research universities working closely together. In fulfilling its broad legislative charge to maximize the level of innovation occurring in Missouri businesses and institutions, the MTC considers its stewardship of RAM as an important way to maximize opportunities for collaborative research.

RAM is operating as a non-incorporated team of the chief research officers of each of Missouri's colleges and universities and non-profit research institutions that have at least \$10 million in research expenditures on an annual basis. RAM continues to be guided by members initially invited by Governor Holden to represent the state's universities and other major research organizations. RAM is staffed by the executive director of MTC who assists with the furtherance of RAM's Mission and Goals.

#### · **The Technology Park at Fort Leonard Wood**

In 1999, the Missouri Technology Corporation advocated for a state investment in a new technology park to be located at Fort Leonard Wood, which is Missouri's largest and most significant military installation. A new technology park was funded and built through a partnership with the University of Missouri System. In response to our advocacy, the Governor and General Assembly approved a \$2.0 million appropriation to the Department of Economic Development for use by the MTC in establishing and constructing the Technology Park. The University of Missouri also committed \$2.0 million to the venture and took on the role of managing partner. Today, Building One at the University of Missouri Technology Park at Fort Leonard Wood is almost fully utilized and is producing a positive cash flow to the owners. Because of the proven demand for space to accommodate organizations engaged in strategic partnerships with the military, the Missouri Technology Corporation and the University of Missouri are collaborating to construct a second building to meet current and future demand.

#### · **Retention of Missouri military bases: Base Realignment and Closure**

The MTC contracted with Missouri Enterprise Business Assistance Corporation to support the development of a strategy to proactively address the next Base Realignment and Closure Commission report (BRAC) announced by Defense Secretary Donald Rumsfeld in January 2004. The so-call Efficient Facilities Initiative 2005 (EFI-2005) is the Pentagon's designation for the BRAC procedure. The object of this effort is to convince federal officials to not only to retain Fort Leonard Wood in Missouri, but also to advocate for reassigning more commands and major functions to the base, consistent with its training mission.

Public financing from the Missouri Development Finance Board and private sector contributions from the Fort Leonard Wood region have produced sufficient revenues to enable contracting with Burdeshaw & Associates, a suburban Washington, D.C. consultant with expertise in military base representation. Burdeshaw is currently working to on behalf of the MTC and its partners in the Ft. Wood region to convince key officials in the Department of Defense that Fort Leonard Wood should be assigned new missions that will work in coordination with existing Joint Force capabilities at the Fort. In addition to Fort Wood, the MTC is also working with a group of interested citizens to fund and prepare a retention strategy for Whiteman Air Force Base that can be communicated to the Department of Defense and to key members of Congress.

#### · **Establishment and Evaluation of Missouri's Innovation Centers**

The MTC is authorized by law to "contract with Missouri not-for-profit corporations for the operation of innovation centers within the state". The MTC's charge is to enable innovation centers to provide "assistance to individuals and business organizations during the early stages of the development of new technology-based business ventures." The MTC provides for the review of Missouri's centers, which are located in the cities of St. Louis, Rolla, Kansas City, Cape Girardeau and Columbia. The MTC requires that each innovation center annually submit a report of its activities to the MTC and the Department which is to include, but not be limited to "the success rate of the businesses graduating from the center, the progress and locations of businesses which have graduated from the center, the types of businesses which have graduated from the center, and the number of jobs created by the businesses involved in the center". The MTC is also responsible for approving the designation of any future innovation centers.

In conjunction with the centers, the MTC has identified appropriate impact measures to evaluate the activities of each innovation center to the center's objectives. The MTC is working in a partnership with the innovation centers to find new methods to calculate the total economic impact that accrues to Missouri citizens as a result of Innovation Center operations.

#### · **Founding of the Missouri Mathematics Academy**

The Missouri Mathematics Academy, a state-wide professional development initiative to deepen students' understanding of mathematics through a community of teachers as learners, was formed in 2001 through a

partnership consisting of the MTC, the Department of Economic Development, the Department of Higher Education, the Department of Elementary and Secondary Education (DESE) and the United States Army. DESE has assumed the role of coordinator of the Academy and is coordinating funding from both public and private sources.

Through the Mathematics Academy, participating middle school math teachers are striving to increase their content and pedagogical knowledge of mathematics through a two-year commitment to a summer academy and professional development program. Through this "community of learners", the participant teachers deepen their understanding of mathematics, so that they can, in turn, deepen their students' understanding.

During each summer since 2001, participants have received intensive work in mathematics content and how to develop ideal lessons to support this content. This approach is a model of effective professional development - content-focused, real life applications to the content, understanding assessment, mentors in the classroom, and regroups throughout the year. Classes are held at Fort Leonard Wood and at the University of Missouri-Columbia. The Academy has trained 40 educators to be master teachers/consultants to provide statewide instruction. During 2003, 73 teachers attended from 26 schools. Participating school principals attend the Academy for three days and must play a major role in the work at their particular school.

#### · Missouri Technology Plan :

In 2001, the MTC prepared an initial technology plan that outlined technology priority areas for the state and, with the governor, convened six roundtables across the state to develop recommendations for actions that would move Missouri forward. The report was a compilation of recommendations made by influential and knowledgeable representatives from the fields of the life sciences, advanced manufacturing and information technology.

The report observed, "technology is the engine driving the new economy and the wealth it creates. Missouri government must support programs that provide the technology infrastructure needed for Missouri companies to grow. This includes allocation of general revenue funds, support of federal R&D, and dedicated state technology organizations." The report also concluded, "companies with highly trained workers will be the successful companies in the twenty-first century. To ensure the necessary supply of these workers, Missouri must continue to emphasize the improvement of math and science skills in our education system, along with increased access to continuing technology training for working adults."

Even though the report was prepared more than three years ago, most of the recommendations that have not yet been accomplished are still valid. The MTC intends to update the Technology Plan as a part of its efforts in 2005.

### Conclusion

This Strategic Plan details the accomplishments of MTC in the past and the planned work of the organization during the state's Fiscal Year 2005 and beyond. The MTC's Board wishes to acknowledge the generous support supplied by the Department of Economic Development not only through continuing financial assistance, but also through the close working relationship that was established in previous years and is being continued through the current administration.

Since the initial meeting of the MTC's Board on November 16, 1994 and its subsequent incorporation with the Secretary of State's Office on January 10, 1995, the Missouri Technology Corporation has dedicated its work to improving the economic opportunities of Missourians and Missouri businesses through the greater investment in new ideas and the growth of entrepreneurship in Missouri's communities.

Through this Strategic Plan, members of the Board and its executive director hope to play an even more aggressive and critical role in efforts by the Governor, the Department of Economic Development, the General Assembly, and many public and private organizations that are trying to improve the level of innovation in our state.

We trust this Plan, and the current operations of the MTC, will fulfill the expectations of Missouri's leaders and citizens that the MTC be a strong and committed leader in efforts to serve Missouri's businesses, communities and workers.

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